# PHYS 302 Intermediate Electrodynamics

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**Objectives:** To learn the fundamentals of classical electromagnetism: electrostatics, magnetostatics, electrodynamics, electromagnetic waves, radiation, and special relativity, and to gain experience with related mathematical topics, especially vector calculus, differential equations, special functions, and tensor analysis.

**Course Credit:** 4 semester hours
**Meeting Times:** Tuesday, Thursday; 9:25-10:40am, with an additional problem session Tuesday; 2:30-3:50
**Classroom:** Herman Brown Hall 453 for lectures and problem sessions
**Format:** A lecture course with weekly problem sets, a take-home midterm exam, and a scheduled final exam.
**Course web page:** Owl-Space

**Textbook:** *Introduction to Electrodynamics*, fourth edition, David J. Griffiths, Pearson/Addison-Wesley, 2012. The content of the course more or less coincides with the contents of the textbook.

**Course Instructor:**
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**Problem Session:** In these sessions, we will spend about half of the time working through example problems and discussing specialty topics, and about half the time discussing homework problems.

**Office Hours:** Monday 4:00pm-5:30pm at Herman Brown 229A (Wei Li), or at other times by (email) appointment (Wei Li, Anthony Chan).

**Grader (late homework may be left in their mailboxes on the second floor of Brockman.)**
Jie Zhang: jx38@rice.edu

**Homework and Grades:** We plan to assign a homework set each week, usually due in class at the beginning of class one week later. Homework sets will be assigned and distributed through the course web page on Owlspace. This is not your only homework. Make sure you read the

textbook and review notes. Using the rule of thumb of 2-3 hours of work outside lectures per credit hour (per week), plan for 8-12 hours per week for this course.

**Homework and Exam Policy:** Every homework assignment and exam is subject to the honor code. You are encouraged to discuss the homework problems with your PHYS 302 classmates and with the instructor and the grader(s), but you must write up your solutions *independently*. Of course, you must not copy anyone else's solutions.

You also may not consult previous year's homework or exam solutions or solutions from third party sources like the internet.

**Late Policy:** The grade for late homework will be multiplied by a decaying exponential with a time constant of three days. Late homework must be delivered to the grader for that problem set and the student must write "Late" and the date and time on the front page.

**Grading Weights:** Homework: 30%
Midterm Exam: 30%
Final Exam: 40%

**Course Content**
We plan to cover each of the twelve chapters in the textbook, at a rate of *roughly* one chapter per week, as follows:

1. Vector Analysis
2. Electrostatics
3. Potentials
4. Electric Fields in Matter
5. Magnetostatics
6. Magnetic Fields in Matter
7. Electrodynamics
8. Conservation Laws
9. Electromagnetic Waves
10. Potentials and Fields
11. Radiation
12. Electrodynamics and Relativity

## Students with disabilities

If you have a documented disability that will impact your work in this class, please contact me to discuss your needs before or during the first week of class. Additionally, you will need to register with the Disability Support Services Office in the Ley Student Center.